



OPERATIONAL TEST
AND EVALUATION

OFFICE OF THE SECRETARY OF DEFENSE
1700 DEFENSE PENTAGON
WASHINGTON, DC 20301-1700

MAY 08 2015

The Honorable William M. "Mac Thornberry
Chairman
Committee on Armed Services
United States House of Representatives
Washington, DC 20515-6035

Dear Mr. Chairman:

(U) I have enclosed my report evaluating Warfighter Information Network – Tactical (WIN-T) operational effectiveness, suitability, and survivability using data gathered from three rounds of operational testing. The classified annex to this report is also enclosed. This report satisfies the provisions of Section 2399 of Title 10 United States Code requiring my report be submitted prior to a full-rate production decision.

(U) The most recent third operational test indicates the Army's program manager for WIN-T has implemented fixes to nearly all of the problems discovered in earlier testing that can be fixed. The majority of WIN-T equipment is operationally effective, and, when satellite communications are available, WIN-T provides the Army with communications and command and control capabilities the Army would not otherwise have. Nonetheless, in all three rounds of operational testing, consistent problems have been observed with the performance of the High-Band Networking Waveform (HNW) and the Tactical Relay – Tower (TR-T), which I continue to evaluate as not operationally effective. The problems with HNW will limit the utility of WIN-T in situations where satellite communications are jammed, disrupted, or otherwise not available.

(U) **The Soldier Network Extension (SNE) was operationally effective.** The Combat Net Radio (CNR) Gateway interface was improved and soldiers were able to bridge their dispersed unit networks with the CNR Gateway. By using the CNR Gateway, brigade and battalion commanders can obtain situational awareness from the forward areas of combat. Soldiers made great use of the WIN-T Chat application during unit operations. SNE users operating in Mine-Resistant Ambush Protected All-Terrain Vehicles (MATVs) found the back seat display useful and applications such as the Tactical Ground Reporting System (TIGR) to be effective. During the 2013 operational test, the SNE was useful for conducting Voice-Over-Internet Protocol (VoIP) calls; however, the utility of VoIP was limited by long call set up times. During the most recent operational test, VoIP calls supported the unit's mission and call set up times were improved, with less than 1.5 percent of calls demonstrating call setup times of 30 seconds or more. The Stryker Point of Presence (PoP) and SNE were operationally effective and similar to the effectiveness demonstrated by the MATV PoP and SNE.

(U) **The Net-Centric Waveform (NCW) network was operationally effective.** There were two NCW network outages during the second operational test that degraded the network's satellite support for an hour or more due to disadvantaged users placing a drain on satellite



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power. Prior to the most recent test, the Army implemented changes making NCW more resilient. During the recent test, the NCW network did not demonstrate the extended outages seen during previous testing.

(U) HNW and the TR-T were not effective for the following reasons:

- (U) Limited transmission range and data throughput for on-the-move nodes, especially in forested areas.
- (U) Low quality (measured by link burst rate) of at-the-halt links provided limited range for transmitting data.
- (U) Inability of HNW to sustain a non-fragmented network in the absence of satellite communications using the NCW.
- (U) Poor use of TR-T and Range Throughput Extension Kit (RTEK) antennas that might otherwise enable more robust network communications in some circumstances.
- (U) Lack of stable long-distance HNW links enabling effective use of applications intolerant to latency and jitter, a deficiency that adds to network congestion.
- (U) Network Management tools that did not support effective use by Soldiers of the TR-T and RTEK.

(U) The consistent problems with HNW are due to the constraints imposed by the physics of the waveform's line-of-sight transmission range and its interactions with terrain and vegetation. Thus, with the potential exception of improved antennas, the program manager has in all likelihood done all he can with hardware and software changes to significantly affect HNW performance. Testing revealed the potential for some improvement in HNW's ability to support network communications through improved training, refinement of tactics, techniques and procedures for the use of antennas, and improvements in network management tools. Even with potential improvements, my evaluation is that HNW will not sustain effective networked communications in the absence of NCW, which could occur if we engage in combat with enemies having the capability to jam or otherwise disrupt satellite communications. Nonetheless, when satellite communications are available, WIN-T provides the Army with at-the-halt (ATH) and on-the-move (OTM) communications and command and control capabilities the Service would not otherwise have.

(U) Developmental testing was conducted by the Army to verify WIN-T's ability to satisfy requirements for ATH and OTM line-of-sight communications capacity using HNW. This developmental testing was conducted in an idealized environment with guaranteed line-of-sight and under other non-operationally realistic conditions--such as allocation of all the system's time division multiple access time slots to single links---that generally do not exist in actual operations. This developmental testing was certainly necessary, but not sufficient, as is often the case, to demonstrate operational effectiveness under realistic combat conditions. Our

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analysis, explained in detail in the attached report, indicates HNW, when evaluated in an operational environment using the same metrics and numerical requirements as those used to evaluate the results of the Army's developmental testing, did not demonstrate required transmission ranges and data rate capacities for OTM and ATH communications, or the potential link quality to meet those requirements.

(U) Suitability. During the most recent testing, the M-ATV PoP and SNE were operationally suitable; however, the Stryker PoP and SNE were not suitable. The Stryker PoP and SNE presented Soldiers with significant human factors engineering and integration issues that interfered with the unit's performance of mission operations; these issues include the following:

- (U) WIN-T displays positioned in front of the gunner;
- (U) WIN-T antennas prevent 360-degree gun coverage;
- (U) WIN-T operations with engine off can drain batteries to a level requiring their replacement;
- (U) Operating WIN-T on vehicle power does not allow "Silent Watch" operations.

(U) Survivability. WIN-T Increment 2 survivability has improved, but significant deficiencies in cybersecurity remain that should be fixed. The classified annex to my report discusses these deficiencies.

(U) My recommendations include the following:

- **(U) Improve employment of HNW with TR-T and Range Throughput Extension Kit (RTEK).** Provide tactics, techniques, and procedures with improved training to employ the HNW network to take full advantage of range extension capabilities provided by the operation of the TR-T and RTEK.
- **(U) Improve NCW.** Determine the cause of momentary NCW link outages and provide a fix for this problem.
- **(U) Reassess the TR-T.** The Army should re-assess its plans for the quantities of TR-Ts fielded to support brigade operations.
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- (U) Integrate WIN-T to afford better use of interior and exterior space to allow more user access, less mission interference, and improve Soldiers' field-of-view during operations.
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 - **(U) Improve Suitability with an Alternative Power Source.** Develop an alternative at-the-halt power source for WIN-T Increment 2 and its required air conditioning to eliminate the need to run PoP, SNE, and Vehicle Wireless Package vehicles 24 hours a day. This capability is required for both MATV and Stryker.
 - **(U) Improve survivability.** The Army should address the deficiencies and recommendations listed in the classified annex to my report.

(U) Section 2399 provides that the Secretary of Defense may submit separate comments on my report, if he so desires. I have sent copies to him; the Under Secretary of Defense for Acquisition, Technology and Logistics; the Secretary of the Army; the Vice Chairman of the Joint Chiefs of Staff; and the Chairmen and Ranking Members of the Congressional defense committees.


J. Michael Gilmore
Director

cc:
The Honorable Adam Smith
Ranking Member



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OFFICE OF THE SECRETARY OF DEFENSE
1700 DEFENSE PENTAGON
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MAY 08 2015

The Honorable Rodney P. Frelinghuysen
Chairman, Subcommittee on Defense
Committee on Appropriations
United States House of Representatives
Washington, DC 20515-6015

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J. Michael Gilmore
Director

cc:
The Honorable Peter J. Visclosky
Ranking Member



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MAY 08 2015

The Honorable John McCain
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510-6050

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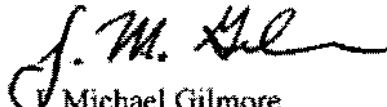
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OPERATIONAL TEST
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The Honorable Thad Cochran
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate
Washington, DC 20510-6025

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 - **(U) Improve Suitability with an Alternative Power Source.** Develop an alternative at-the-halt power source for WIN-T Increment 2 and its required air conditioning to eliminate the need to run PoP, SNE, and Vehicle Wireless Package vehicles 24 hours a day. This capability is required for both MATV and Stryker.
 - **(U) Improve survivability.** The Army should address the deficiencies and recommendations listed in the classified annex to my report.

(U) Section 2399 provides that the Secretary of Defense may submit separate comments on my report, if he so desires. I have sent copies to him; the Under Secretary of Defense for Acquisition, Technology and Logistics; the Secretary of the Army; the Vice Chairman of the Joint Chiefs of Staff; and the Chairmen and Ranking Members of the Congressional defense committees.


J. Michael Gilmore
Director

cc:
The Honorable Richard J. Durbin
Vice Chairman